

WHAT IS CLAIMED IS:

1. A method of manufacturing a thin film transistor comprising the steps of: forming a first non-single crystal semiconductor layer on an insulating surface; crystallizing said non-single crystal semiconductor layer by irradiating said layer with a laser light; depositing a second non-single crystal semiconductor layer having an impurity conductivity type to form source and drain regions on the crystallized semiconductor layer; and irradiating said second non-single crystal semiconductor layer with a halogen or Xe lamp light in order to activate an impurity contained in said second semiconductor layer.
2. The method of claim 1 further comprising the step of patterning said second semiconductor layer into the source and drain regions before irradiating the halogen or Xe lamp light.
3. The method of claim 1 wherein the energy density of said halogen or Xe lamp is 150 mJ/cm² or less.
4. The method of claim 1 wherein said second semiconductor layer has an n-type conductivity.
5. The method of claim 1 wherein said first non-single crystal semiconductor layer comprises an intrinsic semiconductor.
6. The method of claim 1 wherein said first and second semiconductor layers are formed by vapor phase deposition, respectively.
7. The method of claim 1 wherein said first non-single crystal semiconductor layer comprises a substantially intrinsic semiconductor.
8. The method of claim 1 wherein said laser is pulsed.

9. A method of manufacturing a thin film transistor comprising source and drain semiconductor regions and a channel region therebetween, said method comprising the steps of:

forming a silicon oxide film on a glass substrate;
forming a semiconductor layer comprising a channel region on said silicon oxide layer;
crystallizing said channel region by a laser light;
depositing a second semiconductor layer having an impurity conductivity type to form source and drain regions on said semiconductor layer; and
activating said source and drain regions by irradiating said source and drain regions with a halogen or Xe lamp light.

10. The method according to claim 9 wherein said laser light is pulsed.

11. A method of manufacturing a thin film transistor having at least a channel region formed within a semiconductor layer on an insulating surface, and source and drain regions adjacent to the channel region and formed on the semiconductor layer, said method comprising the steps of:

crystallizing the channel region by laser light;
activating the source and drain regions by irradiating the source, drain and channel regions with a halogen or Xe lamp light,
wherein said irradiation of said source, drain and channel regions with the halogen or Xe lamp light is carried out without masking the channel region.

12. The method of claim 11 wherein said source and drain regions comprise n-type semiconductors.

13. The method of claim 11 wherein said laser light is pulsed.

14. A method of forming a thin film transistor comprising the steps of:
forming a non-single crystalline semiconductor film including a channel region therein;
crystallizing said non-single crystalline semiconductor film by irradiating said film with a laser light;

activating said impurity by a halogen or Xe lamp light.

21. The method of claim 20 wherein said laser light is pulsed.
22. A method of manufacturing a semiconductor device comprising the steps of:
forming a silicon oxide film on a glass substrate;
forming a non-single crystalline semiconductor film including at least a channel region on said silicon oxide film;
crystallizing said semiconductor film by irradiating said film with a laser light;
and then
exposing said semiconductor film to a halogen or a Xe lamp light.
23. The method of claim 22 wherein said laser light is pulsed.

forming source and drain semiconductor regions containing an impurity of one conductivity type with said channel region interposed therebetween;

activating said impurity contained in the source and drain semiconductor regions by irradiating said regions with a halogen or Xe lamp light; and

forming a gate insulating layer on said non-single crystalline semiconductor film.

15. The method of claim 14 wherein said laser light is pulsed.

16. The method of claim 14 wherein said laser light is an excimer laser.

17. A method of forming a thin film transistor comprising the steps of:

forming a non-single crystalline semiconductor film including a channel region therein;

crystallizing said non-single crystalline semiconductor film by irradiating said film with an laser light;

forming source and drain semiconductor regions containing an impurity on one conductivity type, with said channel region interposed therebetween;

forming an insulating layer over said non-single crystalline semiconductor film and said source and drain semiconductor regions; and

activating said impurity contained in the source and drain regions by irradiating said regions with a halogen or Xe lamp light.

18. The method of claim 17 wherein said laser light is pulsed.

19. The method of claim 17 wherein said laser light is an excimer laser light.

20. A method of forming a thin film transistor comprising the steps of:

forming a non-single crystalline semiconductor film including a channel region therein;

crystallizing said non-single crystalline semiconductor film by irradiating said film with laser light; and

forming source and drain semiconductor regions containing an impurity on one conductivity type, with said channel region interposed therebetween; and